Department of LABOR AND INDUSTRIES

ELECTRICAL CURRENTS

Code guidance from the Department of Labor and Industries
Office of the Chief Electrical Inspector

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Our 12th month! Electrical code issues and answers.

● Plan review of SPI funded school projects

Cities that have their own electrical inspection programs have been doing their own plan review as required by WAC 296-46-140 effective June 30, 1998. (See *September 1998 ELECTRICAL CURRENTS*.) There was an exception for Superintendent of Public Instruction (SPI) funded school projects because SPI WAC rules required Labor and Industries to do the electrical plan review. However, as of November 1, 1998, SPI rules have been changed and cities are now allowed to do these school project reviews. The department has supplied the Superintendent of Public Instruction's office with the names of the municipalities on record as having their own electrical inspection programs. All new submittals sent to the department for projects within these jurisdictions will be returned, so that they can be resubmitted to the city responsible for the electrical inspection.

● Fee schedule

New electrical work permit fees have been in effect since June 30, 1998. To promote consistency in the application of the fee schedule statewide, field services personnel and electrical inspectors are currently being trained to properly apply these fees. Copies of the materials used in the training sessions are available to our customers in an effort to help make the fee schedule more user friendly. Residential and commercial fee calculation worksheets created to aid customers in the process of purchasing a permit and calculating correct fees are also available on our website and at our service locations.

The department's statutory mandate is to "*set by rule a schedule of license and electrical work permit fees that will cover the costs of administration and enforcement of this chapter" (RCW 19.28.210)*, subject to the recommendations and approval of the Electrical Board. It is the department's responsibility to insure that the inspection activity requested by our customers is fully supported by the inspection fees. Electrical installations are complex and consequently the inspection fee schedule (WAC 296-46-910) that has evolved over the last 15-20 years is complex. The department is dedicated to helping our customers better understand how to accurately determine inspection fees. We will include regular articles regarding details of the fee schedule in this newsletter. The following is the first of such articles.

● Inspection fees for altered services and feeders

Inspections of altered services and feeders are priced 15-20% less than new work of the same size and rating. For this lower fee rate, it is the intent that the work can be inspected in one requested inspection trip. In order to qualify for this lower rate, there are three types of electrical modifications considered in this category. The first is when existing equipment is replaced with new equipment in exactly the same location. This is normally done when a damaged or obsolete panel is being replaced with a new one. The second is when existing equipment is moved to a new location. This is typical when structural modifications or partition wall alterations require panel relocations. When new equipment is installed in a new location, even if immediately adjacent to old equipment, the work is no longer eligible for the lower altered service or feeder rate. The third example of a modification that qualifies as an altered service or feeder is a panel upgrade (size increase) in the exact same location as an existing service or feeder panel. This type of an upgrade would be sized according to the resulting service rating when the modifications are completed. In some upgrade installations where existing service equipment and conductors are left completely unaltered and require no additional inspection, the inspection fee can be calculated for the added service capacity only.

The inspection of existing circuits that are reconnected to new equipment in the same location, and the inspection of circuits extended to existing equipment in its new location, are included in the altered service or feeder fee for both residential and commercial construction. In one and two family dwelling unit construction where the fee basis is square-footage, the department has allowed some additional new circuits to be added to existing remodeled spaces under the altered service or feeder fee. It is expected that such circuit additions will be completed and ready for inspection during the initial inspection trip. If the circumstances of a particular construction schedule require

requesting more than one inspection for an altered service or feeder fee, then additional progress inspection trip fees (at $32.25 per half-hour) will be required. A re-inspection trip to verify the completion of electrical safety corrections that were written during a requested inspection is not charged as a progress inspection trip. However, an additional re-inspection trip necessitated by improperly completed corrections, or creating more electrical safety corrections through negligence, carelessness, or improperly installed electrical work will be assessed an inspection trip fee per WAC 296-46-910(5)(j)(iv).

It should be noted that in residential remodel work that involves the complete removal of existing wiring, the re-wiring of these spaces would be evaluated as new electrical construction. Fees will be based on the square-footage re-wired in accordance with WAC 296-46-910(1)(a) RESIDENTIAL. Additionally, rooms and spaces created when new square-footage is added to an existing building are also new construction. Fees for this type of work will be based on square-footage and also calculated per WAC 296-46-910(1)(a) RESIDENTIAL.

● Aircraft storage buildings on residential property.

NEC 513-1 Definition states *"An aircraft hanger is a location used for storage or servicing of aircraft in which gasoline, or other volatile flammable liquids or flammable gases or any jet fuels are used. It shall not include locations used exclusively for aircraft that have never contained such liquids or gases, or aircraft drained and properly purged (unfueled)."* Buildings on residential property used for storage of private aircraft are not specifically addressed in the National Electrical Code. However, those buildings that fit the definition of an aircraft hangar and have been classified as such by the local building department (Uniform Building Code, group and division, S-5 and H-5) will be inspected to meet all the applicable provisions found in Article 513. One of the main concerns in these buildings is the presence of flammable liquids or flammable gases. All sizes of aircraft may be equipped with fuel drains that are used to eliminate the presence of water in the fuel tank. This pre-flight test is often done in the hangar. A major risk of fuel leakage comes from maintenance that is routinely done in the hanger. If the plane won't fly or isn't safe to fly there's no way to get it to a repair facility.

It should be noted that contractors and electricians doing the electrical work in those buildings classified as aircraft hangars must be (01) general electrical contractors or certified as (EL01) journeyman electricians. The wiring methods required for aircraft hangars are not within the scope of residential specialty contractor licensing or residential specialty electrician certification. Wiring for those storage buildings on residential property not classified as aircraft hangers must comply with any of the wiring methods found in Chapter 3 of the National Electrical Code.

Buildings classified as aircraft hangers are not "outbuildings" (serving a direct accessory function to the dwelling, such as a pump house) or "detached garages" as described in the residential fee schedule. Proper inspection fees are found in WAC 296-46-910, table (1)(b) for multifamily dwellings and miscellaneous residential structures. The fee will be based on the ampacity of the building service or feeder.

● Sizing equipment bonding jumpers on the supply side of a service

When bonding metallic raceways that contain service entrance conductors in an open bottom switchboard or metallic enclosure where bonding bushings are used, the equipment bonding jumper, *"shall not be smaller than the sizes shown in Table 250-94 for grounding electrode conductors. Where the service-entrance phase conductors are larger than 1100 kcmil copper or 1750 kcmil aluminum, the bonding jumper shall have an area not less than 12 ½ percent of the area of the largest phase conductor except that, where the phase conductors and the bonding jumper are of different materials (copper or aluminum), the minimum size of the bonding jumper shall be based on the assumed use of phase conductors of the same material as the bonding jumper and with an ampacity equivalent to that of the installed phase conductors. Where the service-entrance conductors are paralleled in two or more raceways or cables, the equipment bonding jumper, where routed with the raceways or cables, shall be run in parallel. The size of the bonding jumper for each raceway or cable shall be based on the size of the service-entrance conductors in each raceway or cable."* Each paralleled raceway can have an individual bonding jumper properly terminated in the bonding bushing lug and in an approved neutral bus, equipment ground bus, or grounding terminal on the other end.

It is permissible to use a single conductor to bond all of the paralleled raceways together and then make a single connection to the neutral bus or equipment grounding bus. However, the conductor must be sized as shown above and based upon the largest total cross-sectional area of all the paralleled conductors for any one phase. If there are a large number of paralleled conductors, 12 ½ percent of the total area of the largest phase conductor can be a very large wire. Problems may be encountered finding large lugs that will terminate on a bonding bushing in a manner that can be approved.